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MINERALOGY AND PETROGRAPHY.[1]

PETROGRAPHICAL NEWS.—As the result of a recent trip through the southern extremity of Africa, E. Cohen[2] has succeeded in giving us quite a good deal of information regarding the Palæozoic formations of the Cape States. The pre-Devonian schists of the coast region have been treated in another place.[3] In the present paper the author confines himself to the various members of the Devonian and Carboniferous systems, and other formations overlying these. The most widespread rocks in this region are sandstones, graywackes and conglomerates. The Karroo formation (Triassic) Cohen divides into a lower, a middle and an upper series. The lower series comprises fragmental rocks with an occasional intercalated layer of an eruptive. The middle series is characterized by the number of layers of eruptives intruded between those of sedimentary rocks as well as by the number of dykes cutting across the latter. The eruptives, with a single exception, are plagioclase augite rocks. By far the larger proportion of these belong to the diabase family, many of them being olivine bearing. In the latter the pœcilitic structure is frequently well marked. The diabases, quartz diabases, proterobase and diabase porphyrites, of both the intercalated layers and the dykes, are regarded by Cohen (as the result of careful analyses) as mere phases of .the same magma. The single exception to the prevailing plagioclase-augite eruptives mentioned above is in the case of a dyke-cutting olivine diabase. The material of this bears a strong resemblance to mica syenite. At the points where the diabase layers come in contact with the interstratified sandstone beds the latter have been subjected to considerable alteration. The unaltered rock is an ochre-yellow, fine grained sandstone, made up of quartz and colorless mica, besides a little iron hydroxide and earthy material. As it approaches the diabase it gradually loses all traces of its bedding planes, and in it is developed a green chloritic mineral, whose nature was not determined. Nearer to the eruptive the chloritic mineral increases in quantity, and in addition there is a development of biotite and a disappearance of the earthy material, which has probably gone to make up the biotite. In immediate contact with the diabase the sandstone has been entirely changed to a typical black hornfels. In it all the constituents have taken on a concretionary form. Analyses of the unaltered sandstone and of two typical altered phases teach that the change in the nature of the sedimentary rock is not due to any addition of diabase material. The dyke rocks produce but little alteration in the neighboring fragmentals. In one case, however, where a dyke cut sandstone, it was noticed that biotite plates were developed parallel to the sedimentary planes of the sandstone, while muscovite formed perpendicular to these planes. The remainder of the paper is devoted to a discussion of the upper members of the Karroo formation and to the Pleistocene deposits.

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[1] Edited by Dr. W. S. Bayley, Madison, Wisconsin.
[2] Neues Jahrb. f. Min., etc., 1887, Beil. Bd. v. p. 195.
[3] Ib., 1874, p. 460.

Another interesting paper is by K. Dalmer,[1] on the quartz trachyte of Campiglia, in Tuscany. The glassy variety of this quartz trachyte is a fine-grained gray rock, consisting of a glassy groundmass in which are porphyritic crystals of sanidine, quartz, biotite and cordierite, with occasional crystals of plagioclase. The quartz grains all possess a rounded outline in cross section, and are surrounded by a zone of glass. In addition to the minerals mentioned above there also occur in this variety prismatic crystals of some member of the scapolite group light red garnets, apatite and zircon. In a felsitic variety scapolite is lacking. In the neighborhood of the quartz grains the felsitic groundmass of the rock is replaced by a zone of glassy material. The cordierite is less fresh and it is in the glassy variety, and in many instances is entirely replaced by pinite. In a third variety, occurring in dykes, the groundmass is completely crystalline. These dykes of grano-porphyritic trachyte were regarded by Lotti[2] as quartz porphyries, and as apophyses of a so-called granite mass which occurs about fifteen hundred metres distant from them. This mass was likewise examined by Dalmer, who, while he finds it to possess the characteristics of a granite porphyry, believes that its present condition is due to the conditions under which it cooled, and that the three trachytes and the granite porphyry are all portions of the same magma, which, from the nature of its surroundings, gave rise to rocks which from their structure and mineralogical composition must be classified under different heads.

Professor C. R. Van Hise[3] communicates some additional[4] notes on the enlargement of hornblende and augite in fragmental and eruptive rocks. In the altered diabases of the Penokee-Gogebic Iron-Bearing Series crystals of uralitized augite are seen to have attached to them long acicular crystals of a very light green hornblende, which extend out from the uralite even into the surrounding decomposed feldspars. In other cases unaltered augite is surrounded by an almost continuous sheet of amphibole. In both cases the crystallographic axes of the two minerals coincide. Dr. G. H. Williams[5] describes the alteration of ilmenite into rutile, in altered diabase from the vicinity of Quinnesec, Mich. Irregularly-shaped pieces of ilmenite are surrounded by a network of little prismatic crystals of rutile.

[1] Neues Jahrb. f. Min., etc., 1887, ii., p. 206.
[2] Atti della Societa Toscana. Vol. vii.
[3] Amer. Jour. Sci., May, 1887, p. 385.
[4] American Naturalist, Dec. 1885, p. 1216.
[5] Neues Jahrb. f. Min., etc., 1887, ii., p. 263.

Alf. Gerhard[1] calls attention to the fact that most of the rocks described as soda-granites are really ordinary granites in which the proportion of sodium is little greater than is usually found in granites. The Ulfserud (Sweden) rock, however, appears really to contain a plagioclase approaching very near to albite in composition.

MINERALOGICAL NEWS.—*Dihydro-thenardite* is the name given by Markownikow[2] to a substance found in a thin colorless bed on the shore of Lake Gori, in the Gouvernement Tiflis, Russia. In composition it is a sodium sulphate differing from thenardite and mirabilite in appearance and its content of water. An analysis yielded 16.15 per cent. of water, corresponding to the formula $Na_2 SO_4 + 2 H_2 O$. It crystallizes in the monoclinic system.—Laist and Norton[1] report the occurrence of a *new antimonide* from near Mytilene, Asia Minor. The new mineral resembles silver in color and lustre. It is massive and brittle. Its hardness is 4.-5. and its specific gravity 8.812. Upon analysis it yielded: $Cu = 73.37$ per cent., $Sb = 26.86$ per cent., corresponding to $Cu_{11} Sb_2$ (breithauptite $= Ni Sb$, dyscrasite $= Ag_3 Sb - Ag_6 Sb$.)— A *Barium manganite* from near Austinville, Wythe county, Virginia, according to Mr. Walker,[3] is of the following composition:

$Mn O_2$	$Mn O$	$Ba O$	$H_2 O$	$Si O_2$	$(Fe_2 O_3. Al_2 O_3)$
68.86	7.51	14.42	5.08	1.98	2.23

It is found imbedded in psilomelane and ferruginous clay in the form of "radiating fine fibrous needles." Its color is brownish-black. Hardness $= 1.5$. Sp. Gr. $= 3.27$. It differs from varvicite $(Mn_4 O_7 + H_2 O)$ and lepidophæite $(Cu Mn_6 O_{12} + 9 H_2 O)$ in containing Barium.[4] Its composition may be represented by the formula $Ba Mn_9 O_{18} +_2 O + 3 H_2 O$. In a letter to the *Neues Jahrbuch für Mineralogie* Darapsky[5] communicates the results of some analyses of certain Chilian zeolites and of a natural *amalgam* to which he ascribes the formula $Ag_{39} Hg$.— A black opaque mineral, associated with the tourmaline of Hamburg, N. J., and DeKalb, N. Y., Mr. Diller[6] thinks may be a fourth form of titanic oxide.

ROSENBUSCH'S "MASSIGE GESTEINE."—The second portion of Professor Rosenbusch's *Massige Gesteine*[7] fully sustains the good impression produced by the first part.[8] This concluding portion of the great handbook of petrography embraces in its treatment the effusive rocks, which are divided into the palæovolcanic and the neovolcanic classes. Under the former are included the quartz-porphyries, the quartz-free porphyries and keratophyres, the porphyrites, the augite-porphyrites and melaphyres, and the picrite-porphyrites. We miss here the elæolite porphyrites, which have been relegated to the questionable group of dyke rocks, and the quartz-porphyrites, which have been merged into the porphyrite family. The melaphyres are now members of the augite-porphyrite family, and the keratophyres have found a home among the quartz-free porphyries. There are nowhere as sharp distinctions made between rocks of different mineralogical and chemical compositions as were found in the first edition of the *Massige Gesteine.* The classification has become somewhat more complicated than the old one, but at the same time it seems more reasonable in the light of recent investigations. Among the neovolcanic rocks we find the liparites and pantellerites, the trachytes and quartz-free pantellerites, the phonolites, the dacites, the andesites, the basalts, the tephrites and basanites, the leucite rocks, the nepheline rocks, the melilite rocks and the limburgites and augitites. We here also miss a few familiar groups. The augite andesites are classed with the andesites. The tephrites and basanites have been united into one family. The entire group of glassy rocks has been eliminated, and the individual members have been included among those families of the neovolcanic rocks with which they are genetically connected. The discovery of a triclinic potassium sodium feldspar by Förstner[1] in the sodium-rich liparites of the island Pantelleria has resulted in the separation of the old liparite family into two subfamilies—the liparites proper, containing sanidine, and the pantellerites containing anorthoclase as their principal feldspathic constituents. Each family among both the palæovolcanic and the neovolcanic effusives is composed of numerous species or varieties, each one of which is characterized by definite properties, as structure, composition, etc., which distinguish it from other members of the same family. But it would require too much space even to mention here the numerous members of the effusive rocks, and would serve but little purpose. The petrographer must study the *Massige Gesteine* if he would keep abreast of his science, and to no others would a detailed discussion of the many new suggestions contained in the book be interesting.

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[1] Ib., 1887, ii., p. 267.

[2] Jour. d. russ. phys.-chem. Gesells. 1887 [I], p. 252; Ref. Ber. d. deutsch. chem. Gesells., 1887, p. 546.

[3] Amer. Chem. Jour., x., Jan. 1886, p. 60.

[4] Ib., p. 41.

[5] Neues Jahrb. f. Min., etc., 1888, i., p. 65.

[6] Amer. Jour. Sci., Jan. 1888, p. 51.

[7] Mikroskopische Physiographie der Massigen Gesteine, 2 Abt. Stuttgart, 1887.

[8] American Naturalist, Feb. 1887, p. 172.

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[1] Zeits. f. Kryst., 1877, i., p. 547, and 1883, viii., p. 125.